CHAPTER-11
BANKS TOTAL FACTOR PRODUCTIVITY BY DISAGGREGATE LEVEL

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ABSTRACT

The banks astute profitability examination features that private segment banks are the main entertainer as far as efficiency development over the timeframe and being the essential area in the general development of economy, they are performing in mindful way pursued by their partners. It has likewise been discovered that TFP approach shows variety in profitability change, consequently, affirming the nearness of extreme challenge, great sound working condition and distinctive social destinations among the banks . It has additionally been finished up from the quartile portrayals of the efficiency of business banks that the banks present in the fourth quartile goes about as the benchmark for the under resourced ones. Out of three possession gatherings, the banks underneath the normal are inadequate as far as the efficiency in keeping money activities. Hence, these banks should attempt the examination of their tasks and the board arrangements therefore to wipe out flimsiness in the profitability development. These banks additionally have the potential for development as far as efficiency as these banks have the inclination of advancing toward the upper quartiles ceaselessly.

Keywords: Disaggregate level, Public sector banks, Private sector banks, Foreign sector banks.

11.1 INTRODUCTION

The positive connection between profitability score and different markers of bank execution are very clear. The outcomes infer that higher efficiency demonstrates sound economy and actuates feel great notions among business banks in India that are giving diverse kind of administrations to their clients.

The positive and reciprocal relationship affirmed by profitability score and execution markers of efficiency demonstrates a solid economy and instigates feeling of soundness among business banks in India while giving administrations to their clients .

11.2 METHODOLOGICAL FRAMEWORK

MPI is an application of DEA with panel data utilized to calculate indices of TFP changes.) suggested three main advantages of this approach. Firstly, it does not require profit maximization or cost minimization assumption. Secondly, it does not require information on the input and output prices. Finally, if the researcher has the panel data, it allows decomposition of productivity changes into two components, i.e., technical efficiency change, or catching up, and technology progress or changes in the best practice. Following the Malmquist input-based productivity index can be written as

$$m_i(x_{t+1}, y_{t+1}, x_t, y_t) = \frac{d_i^{t+1}(x_{t+1}, y_{t+1})}{d_i^t(x_t, y_t)} \left[\frac{d_i^t(x_{t+1}, y_{t+1})}{d_i^t(x_t, y_t)} X \frac{d_i^{t+1}(x_{t+1}, y_{t+1})}{d_i^{t+1}(x_t, y_t)} \right]^{\frac{1}{2}}$$

The ratio outside the braces represents change in relative efficiency between year t and t+1, whereas, the geometric mean of two ratios inside the braces represents shift in the technology between the two time periods. However, the HMTFP index was introduced and the rationale for computing classic MPI does not measure properly changes in productivity at the time of changes in returns to scale. O'Donnell (2010b) refers that the TFP indices can be expressed in terms of aggregate quantities so as to be multiplicatively complete. As described earlier, the class of multiplicatively complete TFP indexes includes the well-known Paasche, Laspeyres, Fisher, Tornquist and HMTFP indexes. Out of all these, only the HMTFP index and FPTFP index can be computed without price data. Another TFP index that can be computed without price data is the Malmquist TFP index of However, MPI is not multiplicatively-complete, hence, cannot be regarded as a valid measure of productivity change The HMTFP is actually a ratio of Malmquist output and input quantity indices and it is named so because of its origins to Hicks and as confronted by and also discussed The HMTFP index operates as follows:

$$TFP_{HM}^{t,t+1} = \left(\frac{D_0^{t+1}(x^{t+1}, y^{t+1}) D_0^t(x^t, y^{t+1})}{D_0^{t+1}(x^{t+1}, y^t) D_0^t(x^t, y^t)} \frac{D_I^{t+1}(x^t, y^{t+1}) D_I^t(x^t, y^t)}{D_I^{t+1}(x^{t+1}, y^{t+1}) D_I^t(x^{t+1}, y^t)} \right)^{\frac{1}{2}}$$

Where, D_O (i, o) and D_I (i, o) are output and input distance funct (2009) developed a methodology

for computing and decomposing the HMTFP index.

11.3 DISAGGREGATE LEVEL MEASURES FOR TOTAL FACTOR PRODUCTIVITY OF BANKS

The estimates for profitability measurement are accounted for in the are ordered into three diverse possession gatherings while assuming that the specialized relapse is disallowed and the innovation is accepted to display VRS. The Table 1.1 presents the measures of aggregate factor profitability change (dTFP) and its segments including specialized change (dTech) and efficiency change (dEff) for three distinctive proprietorship gatherings, specifically, open, private and remote area bank bunches over the timeframe. The table furthermore expounds the segments for dTech as far as input-oriented specialized efficiency change (dITE), blend efficiency change (dIME) and remaining input-oriented scale efficiency change (dRISE). Assessed esteem more prominent than unitary delineates efficiency development and in actuality, not exactly unitary presumes profitability relapse

Public Sector Banks: In this sub-segment the improvement in dTFP and its segments is featured in the event of open division banks. It has been seen from the Table 1.1. that banks under open proprietorships are encountering profitability relapse with special case to Allahabad Bank, Andhra Bank, IDBI Bank Limited, Indian Bank, Indian Overseas Bank, State Bank of Bikaner and Jaipur, State Bank of Hyderabad, State Bank of Travancore, UCO Bank and United Bank of India which are delineating a normal enhancement of 0.1 percent, 2.5 percent, 0.8 percent, 4.1 percent, 0.6 percent, 0.7 percent, 0.1 percent, 2.6 percent, 0.5 percent and 6.2 percent, individually. In any case, on a normal dTFP file for the whole PSBs has ended up being 0.960, which reflects TFP relapse at a yearly normal rate of 4.0 percent. Taking a gander at the figures of dTech (1.039) and dEff (0.884), it has been affirmed that dTech shows up as the real patron toward the development as the assessed qualities for dTech are more prominent than solidarity. This features the enhancement in the dimension of innovation will probaliy leads towards the development underway plausibility set for banks out in the open division gathering. This further approves the examination of parts in charge of profitability development as far as PSBs. Then again, dEff gives off an impression of being contrarily contributing towards the dimension of efficiency at a normal rate of 11.6 percent, wherever the decay has been experienced, consequently, approve the investigation for component(s) in charge of profitability relapse as far as PSBs.

By and large, the exact examination proposes open part banks in India portray relapse in the profitability with efficiency change as the sole supporter. These confirmations surmises that getting up to speed occurred at moderate rate for banks. A portion of the explanations behind TFP gains, wherever experienced, incorporate the defense in utilization of inputs, presentation of innovation based items, usage of strict control components, developments to oblige e-saving money, developing nearby and off-site ATMs, and so on. These reasons prompted the nearness of the marvel of critical boondocks moves in Indian open part managing an account and affirm that PSBs have responded decidedly and forcefully to the progressions happened amid post-deregulation period. Then again, the decay saw in the profitability might be because of the ill-advised choices by the board while giving administrations to the clients. The wasteful development on the boondocks has prompted the wasteful working, in this manner, driving towards the relapse in profitability for PSBs in India. In any case, being subject to different segments, the outcomes uncovered that the efficiency change segment dRISE alongwith dIME are the main hotspot for the decay saw in 16 open area banks out of 26 amid post-deregulation period. The examination of the Table 1.1 illustrates that 16 banks endured misfortune because of leftover input oriented scale efficiency measures with normal score of 0.911 pursued by the adjustment in blend efficiency score reflecting normal decrease at the rate of 2.4 percent, separately. In this manner, there is a need to make impromptu creation for scale and blend efficiency parts to limit the distinction between TFP at in fact proficient point and the most extreme TFP conceivable while modifying both the input and yield blend with the current innovation. Being a reason for profitability relapse, the bank working close to the unlimited wilderness are not working at the most gainful scale measure and along these lines, they have to address their scale estimate in order to work at the ideal scale of creation and furthermore make right use of inputs for the effective activities.

Table 1.1 additionally drills down better and failing to meet expectations PSBs on the facade of TFP development. Specifically, these banks lay on the outrageous edges of the TFP step where better performing banks encounter most noteworthy TFP development and failing to meet expectations banks encounters the minimum. From the Table 1.1, it very well may be seen that United Bank of India (6.2 percent) is the best performing PSB on profitability front. It fills in as the benchmark and can turn into the good example for the failing to meet expectations banks. Then again, Corporation Bank (- 17.3 percent) is found at the lower end of TFP stepping stool. This needs updating of the asset usage process. Be that as it may, the explanation behind such TFP development of United Bank of India might be because of supervision of less number of branches, staff and more concentration towards mechanical

advancements in the bank than the other open part banks in Indian, particularly Corporation Bank. What's more, while making a relative correlation among the banks that are practicing the efficiency relapse. The relapse in efficiency crosswise over extensive number of PSBs is observed to balance the increases in TFP. This, thus, brings about speaking to the generally modest number of banks, i.e., 39.0 percent with TFP development.

Private Sector Banks: The motivation behind this sub-area is to break down the profitability profile of PrSBs in India amid the post-deregulation period. It very well may be seen from the Table 1.1 that alongwith open area banks, the banks falling in the class of private division are likewise completely in charge of the development and advancement of keeping money segment and the general economy of nation, significantly. While investigating different measures of execution given by HMTFP file, private banks experienced profitability relapse. Be that as it may, thinking about the whole gathering, geometric mean of dTFP is seen to be 0.985, which demonstrates that the profitability of PrSBs in Indian keeping money segment has relapsed at a normal rate of 1.5 percent. Actually being reliant on various segments, it has been seen that the relapse is credited towards the decrease in efficiency change that counterbalance the impact of mechanical developments. It has been seen from the outline measurements of private part banks that dTech has expanded 3.8 percent, while the decrease in the efficiency is at the rate of 11.7 percent. Subsequently, it unmistakably mirrors that the decrease saw in the private division banks is a direct result of decay in efficiency change.

Be that as it may, with exemption to Axis Bank (2.8 percent), City Union Bank (1.3 percent) ING Vysya Bank (0.7 percent), Ratnakar Bank (2.2 percent) and Tamilnad Mercantile Bank (6.3 percent) which portrays development in profitability change because of specialized advancement, the normal score of individual banks for private area gather saw to be relapsed because of efficiency change part, in outcome, counterbalancing the development in TFP change because of mechanical advancement. Then again, change in efficiency parts has all the earmarks of being the mindful factor for relapse and henceforth has been considered as sole benefactor for decrease in TFP of PrSBs.

The plausible purpose behind such decrease in profitability development for the PrSBs may be the whole spotlight on giving the innovation imaginative administrations to their clients and less spotlight on working up strong client base by proficient administrations. Efficiency change part shows up as a capable segment for relapse in profitability, yet being subject to different segments like dITE, dIME and

dRISE, it turns out to be moderately increasingly imperative to have a complete investigate these estimates for private segment banks in India. It has been uncovered from the outcomes that the normal score of scale efficiency (0.882) trailed by blend efficiency (0.990) and specialized efficiency change (0.993) mirror a relapse in these parts by 11.8 percent, 10.0 percent and 0.7 percent, separately. Subsequently, it has been noticed that scale efficiency part seems, by all accounts, to be the capable segment for relapse in efficiency change driving towards decrease in TFP. Along these lines, banks need to take the vital changes for the breaking down efficiency change by making use of accessible assets powerful and furthermore need to address their scale measure in order to work at the proficient creation boondocks. Table 1.1 likewise rattles off best and lower performing banks based on TFP front. The private bank which performed amazingly is Tamilnad Mercentile Bank (6.2 percent). The watched profitability upgrades have been brought by mechanical advancement instead of enhancement in efficiency and thus are considered as the most reasonable for the benchmark of other private banks. Then again, Jammu and Kashmir Bank (- 4.8 percent) seems to lie on the lower side of TFP stepping stool. When all is said in done, while making an overall examination of banks that are encountering the profitability relapse, the efficiency change part counterbalance the impact of mechanical advancement and just 37.0 percent of the banks can accomplish the TFP gains.

Foreign Sector Banks: This sector is one of the vital instruments that provide linkagebetween domestic sectors of Indian economy with the other economies of the world. Being responsible for various activities placed in terms of foreign exchange, FSB sector also plays responsible and dominant role in the development and growth of the Indian economy. Therefore, to judge the overall development of the financial sector in India, it becomes essential to make proper analysis of this sector also. Table 1.1 depicts that the foreign sector banks are experiencing productivity regress with exception to Bank of Bahrain & Kuwait (7.7 per cent), Bank of Nova Scotia (0.7 per cent), Bank of Tokyo Mitsubishi (1.4 per cent), DBS Bank (2.9 per cent), Deutsche Bank (1.4 per cent), HSBC (1.1 per cent) and HSBC Bank Oman (6.1 per cent) during the post-deregulation period. However, the value of geometric mean for dTFP index has turned out to be 1.043 indicating that the productivity of FSBs regresses at the rate of 3.0 per cent.

It has been, further, noted that the ground for productivity decline has efficiency change components in all the banks in foreign sector group with a regress rate of 10.7 per cent relative to the innovation or technological effect at the rate of 1.4 per cent barring exception to BNP Paribas, Mashreq Bank and

Sonali Bank that depict regress due to both technological as well as efficiency regress. Thus, the decline is associated with catching-up effect rather than technological innovations for foreign sector banks in India. Being dependent on components like dITE, dIME and dRISE, it is observed from perusal of the Table 1.1 that average value of 0.963 (dITE), 0.963 (dIME) and 0.907 (dRISE) elucidates that the dominant source of TFP behaviour for banks in foreign ownership can be ascertained to scale efficiency change component followed by mix and technical efficiency effect, which further reveals an average regress rate of 10.3 per cent and 3.7 per cent, respectively. Hence, scale efficiency component played main role of culprit for efficiency changes leading towards overall regress in TFP growth.

In general, the analysis of productivity change highlighted that the decline in efficiency change components is being confirmed as the responsible factor for the decline in productivity of the banks (expect for BNP Paribas -5.8 per cent), which depicts the major attributable factor for regress as technological change. Moreover, the results conclude that banks are not able to identify the correct mix of inputs and outputs and should try to operate at the most productive scale size in order to place themselves at efficient production frontier. It has also been noted that Bank of Bahrain & Kuwait (7.7 per cent) appears to be the top performing banks with considerably large TFP gain during the sample period, thus, appears to be the most suitable bank for benchmarking of underperforming banks in FSB category. Further, Societe Generale (-15.6 per cent) emerges at the lower ladder of TFP and the losses suffered by the banks is due to efficiency regress. In addition, (while making the relative comparison for the productivity regress) it has been observed that the productivity decline due to efficiency regress in the banks offset the effect of technological progress in FSBs. Thus, in turn, results in only 35.0 per cent of gain in TFP.

In order to compare the level of distribution for TFP among the different ownership bank groups over the period of time, various parametric and non-parametric tests have been conducted by the researchers (Kumar and Gulati, 2008; Elyasiani and Mehdian, 1990). Accordingly, the present study has applied the Kruskal-Wallis test to serve the mentioned purpose. The Kruskal-Wallis test is non-parametric in nature and do not follow the assumption for the normality. The Kruskal-Wallis compares the entire distributed sample. The test statistics indicates that for all the efficiency and productivity measures, the respective null hypothesis cannot be rejected. This indicates that the differences among the three ownership bank groups are not statistically significant (refer Table 1.1). Thus, statistically there are no significant differences for the mean levels of TFP scores among the public, private and foreign sector bank groups

associated with the Indian banking industry.

Therefore, the analysis of the bank-wise productivity change and its associated components reveal that there has been considerable deterioration in terms of scale efficiency. It has affected the significant positive changes of dTech, thereby, limiting the extent of TFP growth for the banks under different ownerships and lead towards regress in the productivity if the banking industry in India. Furthermore, United Bank of India, Tamilnad Mercentile Bank and Societe Generale (on an average) are experiencing the highest productivity growth of 6.2 per cent, 6.3 per cent and 7.7 per cent among the public, private and foreign sector banks. A general conclusion of HMTFP index reveals that the dEff has been identified as the responsible component for decline in different banks, thereby, depicting that those banks are not able to make use of resources at optimal level. However, such results are further been attributable towards the production of services at most inefficient scale size with improper mix of inputs and outputs at the frontier. In other words, all banks under their respective ownership are affected according to the adaptation of the technological parameters by the banks, thereby; leading to respective expansions or contractions in the production possibilities set, but are not able to produce at optimal level. However, change in the production possibilities set can be attributable to any changes in the environment as corroborated by the study conducted by Arjomandi and Valadkhani (2010) while analyzing the performance of the banking industry. Thus, on the whole, productivity decline is noted to be due to the efficiency regress and it offsets the effects of technological progress for all the banks under different ownerships.

In addition, it has been found that HMTFP approach demonstrates variation in productivity growth and productivity change, thereby, confirming the presence of tough competition, good health operations and different social objectives among the banks. Furthermore the findings suggest that the estimate of productivity change exhibits fluctuations in terms of technology changes that have incorporated the changes initiated by policy makers and government during different intervals. The advancement in terms of credit facility, ATMs, online branches, mobile banking, credit and debit cards, etc. have helped banks to compete in the competitive environment over the years and on the other hand, the presence of NPAs and other competitive pressure may have affected banks in terms of efficiency changes. In nutshell, productivity regress has been experienced by the banking sector in India and the primary reason for productivity regress at aggregate and disaggregate level can be that banks have given less attention to improve efficiency and are more focused towards technological advancement in belief of providing

services at most productive scale of operations.

11.4 CONCLUSION

Moreover, the banks astute profitability examination features that private segment banks are the main entertainer as far as efficiency development over the timeframe and being the essential area in the general development of economy, they are performing in mindful way pursued by their partners. It has likewise been discovered that HMTFP approach shows variety in profitability change, consequently, affirming the nearness of extreme challenge, great sound working condition and distinctive social destinations among the banks (iv) It has additionally been finished up from the quartile portrayals of the efficiency of business banks that the banks present in the fourth quartile goes about as the benchmark for the under resourced ones. Out of three possession gatherings, the banks underneath the normal are inadequate as far as the efficiency in keeping money activities. Hence, these banks should attempt the examination of their tasks and the board arrangements therefore to wipe out flimsiness in the profitability development. These banks additionally have the potential for development as far as efficiency as these banks have the inclination of advancing toward the upper quartiles ceaselessly. The banks working close to the unhindered outskirts are not working at the MPSS and in this way, need to address their scale measure to work at the ideal scale of generation. Consequently, on a normal, dRISE means that while holding the input and yield blend settled and enabling the dimension to differ banks even in the wake of changing the scale of activity are appearing and are working underneath the dimension of MPSS. At last, the banks in India need to concentrate on improving their scale measure, defeat their significant scale wasteful aspects in order to work at the ideal effective wilderness and furthermore need to concentrate on making interest in the territories were the odds of non-performing assets are less.

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